Université d'Ottawa
Faculté de génie

Département de
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Faculty of Engineering

Department of
Civil Engineering

GNG 1105 A – ENGINEERING MECHANICS

Mid-Term Examination

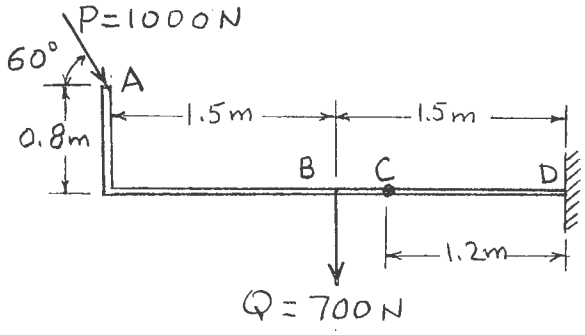
Prof. A. Skaff

November 1, 2012

Time: 80minutes

Closed Book Examination. Programmable calculators are not allowed. Free Body Diagrams must be drawn wherever appropriate.

Problem # 1 (15 points)

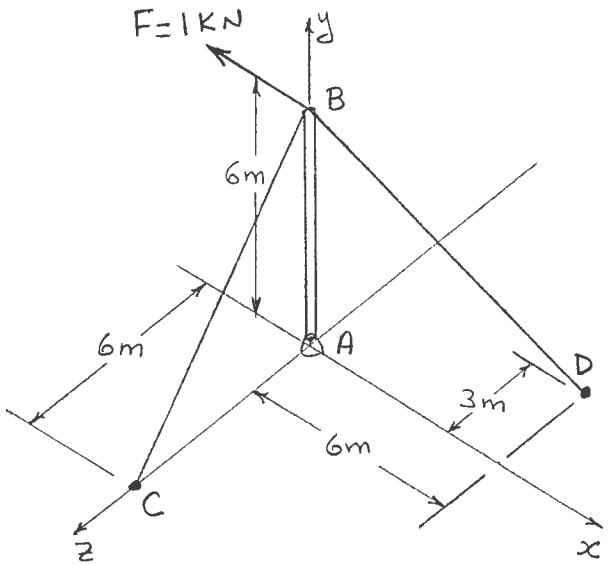


ABCD is an L-shaped bracket loaded as shown.

The support at D is a fixed one.

a) Reduce the forces P & Q into an equivalent force-couple system at point C.
b) Calculate the reactions at point D.

Problem # 2 (15 points)



Pole AB is being acted upon by a force F = 1 KN.

F is parallel to the x-axis and is acting at point B.

Pole AB is being held in equilibrium by a ball and socket

Joint at A and by two cables BC and BD as shown.

a) Draw the Free-Body -Diagram of AB.
b) Write the tensions in cables BC & BD in vector form.
c) Calculate the tensions in cables BC & BD and the components of the reaction at point A.